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THE FALL RIVER SLIDING SCALE EXPERIMENT OF 1905-1910

In the cotton textile mills of Fall River, Massachusetts, between 1905 and 1910 an experiment was made in the determination of rates of wages by the method of the sliding scale agreement. From the standpoints both of the employers and of the employees immediately concerned this experiment constituted an attempt to secure a *modus vivendi* which would prove mutually beneficial and satisfactory. It is possible to view the subject of this experiment, then, as one that may throw some light upon the problems of collective bargaining in this particular industry, by the study of which employers and employees may be advised with reference to situations that may arise in the future.

But the broad, theoretical question is this: Were the Fall River sliding scale agreements of 1905 and 1907 fundamentally sound in principle? Their mere abandonment does not afford an answer. For soundness and unsoundness of theoretical foundations are often intricately confused with efficiency and inefficiency of administration. With the personal problems of administration connected with these particular sliding scale agreements we have no concern at this time. Attention is here centered upon matters of fundamental principle, with the assumption that the personal factors involved were of such a quality as to afford no justification for any attempt to place upon them the responsibility for disappointing results.

In attempting to reply to this question this paper will (1) present briefly the facts of importance to the understanding of the industrial situation in the Fall River cotton mills; (2) narrate without attempt at critical analysis the history of the sliding scale experiment, including in this part of the treatment, of course, the necessary descriptions and explanations of the agreements themselves; and (3) present an analysis of the experiment with a view to ascertaining its merits and defects.

The Industrial Situation in Fall River

The city of Fall River, with its population of approximately 120,000 and its cotton mills numbering about fifty, has the distinction of being the city first in importance in the cotton textile industry of the United States. Its 75,000 looms and 3,000,000 spindles, with the machines used in the subsidiary processes, require the services of approximately 30,000 employees. These em-

ployees, like the textile employees throughout New England, are for the most part foreign born or of foreign extraction. In Fall River the English and Irish groups have exerted a greater influence than in most of the New England cotton manufacturing centers; a fact which has doubtless been partially responsible for the superiority of the Fall River operatives over other groups in matters of organization for purposes of collective bargaining.¹

In general, the operatives of the different racial groups distribute themselves throughout the several departments of the mills in such a way that the heavier, coarser, and less skilled tasks fall to the groups of more recent admission to the country. Among these last-mentioned workers labor organization on the craft basis is developed very slightly, if at all. These workers, for the most part engaged in the less standardized, subsidiary or minor processes, lack strength of organization and depend quite largely for leadership in collective bargaining in matters involving wages upon the local organizations of mule spinners, weavers, slasher tenders, carders, and loom fixers. From time to time general textile organizations such as the United Textile Workers of America (organized in 1901) and more recently the National Amalgamation of Textile Operatives (organized in January, 1916) have exerted some influence with and in behalf of the local organizations of the Fall River operatives. But, at least for the period of the sliding scale experiment, the Fall River Textile Council, composed of representatives of the five major craft unions above named, served as the bargaining agency of the workers.

On the side of the employers the mechanism for collective bargaining has consisted, for a considerable number of years, of an organization now styled the Cotton Manufacturers' Association,² in the membership of which are included nearly all of the cotton mills of the city. The Fall River Iron Works, a corporation running about 12,000 looms and 485,000 spindles, is the one mill

¹ New Bedford, the chief city in the fine goods manufacture, is a possible exception to this statement.

² This association was formed on April 19, 1873, as the Manufacturers' Board of Trade. The name was changed to its present form on October 27, 1890. Collective bargaining was first participated in on January 30, 1875, when the association dealt with a committee of weavers. The present Textile Council is first mentioned in the association's records on February 20, 1899, which may be considered to be the date of the termination of collective bargaining with the operatives simply as members of particular crafts.

of considerable importance which has persistently declined to deal indirectly with its own employees in matters concerning wages. Occasionally this mill has made changes in wages which have influenced the wage policy of the Cotton Manufacturers' Association. But the important fact is that throughout the mills of Fall River there was, even before the formal sliding scale agreements were made, substantial uniformity of wage policy and of changes of rates of wages.

In view of the extent to which the principle of the division of labor is applied in the manufacture of cotton yarn and cloth it is important for the purposes of this study that there has been substantial uniformity of changes of rates of wages as between the different departments of the mills.³ That this has been the case is the testimony of leaders of the Fall River craft unions, given in conversation or in correspondence with the writer. It is also the opinion of a Fall River manufacturer, Mr. J. T. Lincoln, expressed in an article on the sliding scale experiment written before the agreement was abandoned.⁴

Not only have changes in rates of wages been substantially uniform throughout the mill departments, but the weaving rate on a standard grade of print cloth has been the basis of discussion and of wage calculation in all general wage disputes. This statement applies both to the period of the sliding scale experiment and to the periods before and after.

With this brief explanation of the industrial situation in the Fall River cotton mills let us pass to the narration of the events of the sliding scale period.

The History of the Sliding Scale Experiment

On July 14, 1904, after a period in which conditions in the industry had been unsatisfactory both to the employers and to the employees, during which period unemployment had been ab-

³ An exception to this statement is the case in 1894 when, on the occasion of a general strike, only the mule spinners were successful. These received a wage advance of 5 per cent, while the rest of the operatives resumed work at the rates previously in force.

⁴ J. T. Lincoln, "The Sliding Scale of Wages in the Cotton Industry," *Quarterly Journal of Economics*, vol. XXIII, pp. 450-469. The quotation is from page 461. This article is chiefly narrative, and little attention is devoted to criticism. Where the writer of the present article has thought it necessary, for the sake of completeness, to repeat facts given by Mr. Lincoln, this repetition has been abbreviated, even at the risk of seeming to present an unbalanced treatment.

normally large and wages in the Fall River mills had been reduced about 10 per cent (in November, 1903), it was announced in the mills represented in the Cotton Manufacturers' Association that on July 25 there would be a further reduction of $12\frac{1}{2}$ per cent. As a result there occurred what is known in the industry as the "great strike of 1904." For nearly six months the Fall River cotton industry was at a standstill. Finally work was resumed on January 18, 1905, on the basis of an agreement "that Governor Douglas should investigate the matter of margins between the cost of cotton to the mill owners and the selling price of cloth, and submit his conclusions as to an average margin, upon which the manufacturers should pay a dividend of 5 per cent on wages earned from January 18 to April 1."⁵

On May 17, Governor Douglas reported that a margin of 74.38 cents was necessary to justify a wage "dividend" of 5 per cent. The margin on January 18 had been 67.80 cents, and had steadily grown smaller. The reduction of the weaving rate to 17.32 cents per cut was therefore accepted by the operatives, with the understanding that with the improvement of trade the mills would move wages up toward the level at which they had stood before the reduction of November, 1903.

On October 17, 1905, the Manufacturers' Association made to the operatives in the mills included in the organization a proposition as follows.⁶ Beginning October 23 wages should be increased about 5 per cent. In addition a sliding scale agreement should be made, according to which, whenever the employers' margin of profit (to be figured as the difference between the price of raw cotton and that of regular print cloth) should exceed 75 cents, there should be a wage dividend or premium of 1 per cent for each cent the margin stood above 75 cents up to a margin of 85 cents; and that for each cent the margin should exceed 85 cents up to a maximum of 95 cents there should be an additional wage premium of $\frac{1}{2}$ of 1 per cent. Calculations of margins and of wages should be made at the end of four-week periods, and the wage premiums should be given to employees of at least two weeks' standing.

⁵ *Commercial and Financial Chronicle*, Sept. 9, 1905, p. 808. See also *Textile World Record*, vol. XXIX, p. 593, and Massachusetts Board of Conciliation and Arbitration, *Annual Report*, January, 1906, pp. 20-22. The last-mentioned source gives Governor Douglas' full report. For an explanation of the method of calculating the margin of profit see note 9 of this article.

⁶ *Chronicle*, Oct. 21, 1905, p. 1268.

Immediately following this proposal of the Manufacturers' Association, the Fall River Iron Works announced an advance of about 14 per cent on the rates of wages prevailing before January 23, 1905.⁷ Dissatisfaction among the employees of the other mills caused by this move gave rise to some talk of a strike to secure similar concessions from the Manufacturers' Association.⁸ This, however, was soon quieted, the Textile Council coming to an agreement with the employers on October 25.

The arrangements then made embraced the same scale of graduated rates suggested in the employers' proposal of October 17, except that 72.5 cents rather than 75 cents was agreed upon as the base margin for a wage of 18 cents per cut for weaving regular print cloth. The base rate of 18 cents was to be the minimum rate. The proposed maximum margin of 95 cents beyond which the wage rate should not slide was excluded from the agreement. And in place of calculations of average margins and wages at intervals of four weeks, provision was made for weekly changes of rates. In the calculation of the margin, two grades of cloth (28-inch and 38½-inch 64 by 64 prints) were to be considered. It was tacitly agreed that the sliding scale should be given a fair trial for one year.⁹ The following schedule of hypothetical margins and weaving rates under this agreement of October, 1905, may help the reader to visualize the plan of wage determination and to make comparisons with later schedules:

Margins (Cents)	Weaving Rates (Cents)	Margins (Cents)	Weaving Rates (Cents)
115.....	22.95	85.....	20.25
110.....	22.50	80.....	19.35
105.....	22.05	75.....	18.45
95.....	21.15	72.5.....	18.00

This first formal sliding scale experiment was of short duration. For this there were two chief reasons. First, under this agreement, the average weaving rate in force was only 18.61 cents

⁷ *Chronicle*, Oct. 21, 1905, pp. 1268, 1269.

⁸ *Ibid.*, Oct. 28, 1905, p. 1329.

⁹ Some sources for the terms of this agreement are: *Chronicle*, Nov. 4, 1905, p. 1385; Lincoln, *loc. cit.*, p. 456; Massachusetts Labor Bulletin, No. 38, p. 342, No. 41, pp. 192-196; *Textile World Record*, vol. XXX, pp. 361-363.

The "margin of profit" which was involved in the sliding scale agreements of 1905-1906 and 1907-1910 and which was considered by Governor Douglas in the arbitration of the dispute of 1904-1905 was a margin of profit per unit of product—the differential between the cost of a certain amount of raw cotton and the price of the cotton cloth into which the raw material was con-

per cut of regular print cloth; which constituted an average "wage premium" of only 3.38 per cent, or only about one half of the desired restoration of wages to the level prevailing between November, 1903, and July, 1904. Second, the rates of wages paid fluctuated so violently from week to week (see Table 1) that the operatives became much dissatisfied and were led to question the validity of the theoretical foundation of the experiment.¹⁰

Dissatisfaction caused by these conditions was intensified when, in May, 1906, voluntary wage advances of 10 per cent were made by certain corporations in Massachusetts and Connecticut engaged in the manufacture of fine goods.¹¹ Although the employers in Fall River were insistent that "increases in fine goods mills, where margins of profit were large, should have no bearing on the general situation in Fall River,"¹² the Textile Council, voicing the feeling of the operatives with regard to the sliding scale, strongly urged the abandonment of the experiment and the restoration of the rates of wages prevailing before July, 1904. This request was made on June 8. On the sixteenth of the same month the Manufacturers' Association made a counter proposal, offering to guarantee a wage premium (on the basis of the sliding scale) of 5 per cent from June 12 to October 1 "with a further guarantee that if the margin in any one week exceeded this 5 per cent in-

verted. The exact method of computation of the margin under both agreements may be reduced to the following rules.

Multiply the price of middling upland cotton by 8 (to get the price of 8 pounds); multiply the selling price per yard of 28-inch print cloth by 45 (the number of yards in a cut); multiply the selling price per yard of 38½-inch print cloth by 33.11 (the number of yards in a cut); add these last two products; divide by 2; deduct the price of the 8 pounds of middling cotton.

For example, using the data for 1881 (see Table 3):

	<i>Cents</i>
45 yards 28" 64x64 print cloth @ 3.95c =	177.75
33.11 yards 38½" 64x64 print cloth @ 7c =	231.77
Sum =	409.52
Divided by 2 =	204.76
8 pounds middling upland cotton @ 12.03c =	96.24
Margin of profit =	108.52

It is to be noted that Governor Douglas considered only the 28-inch prints in making his computations.

¹⁰ For an elaboration of this point see Lincoln, pp. 456-459.

¹¹ *Chronicle*, June 23, 1906, pp. 1405, 1406.

¹² *Ibid.*, Sept. 8, 1906, p. 531.

TABLE 1.—ACTUAL MARGINS AND RATES UNDER AGREEMENT OF OCTOBER, 1905.¹

Week ended	Margins	Wage premiums	Weaving rates	Week ended	Margins	Wage premiums	Weaving rates
1905	(Cents)	(Per cent)	(Cents)	1906	(Cents)	(Per cent)	(Cents)
Oct. 27	77.00	5	18.90	Mar. 3	82.85	10	19.80
Nov. 3	75.70	3	18.54	10	80.19	8	19.44
10	71.40	0	18.00	17	81.27	9	19.62
17	74.00	2	18.36	24	77.82	5	18.90
24	73.50	1	18.18	31	75.42	3	18.54
Dec. 1	75.20	3	18.54	Apr. 7	76.15	4	18.72
8	72.40	0	18.00	14	75.02	3	18.54
15	75.02	3	18.54	21	74.82	2	18.36
22	73.76	1	18.18	28	75.55	3	18.54
29	75.37	3	18.54	May 5	72.85	0	18.00
1906				12	71.40	0	18.00
Jan. 5	76.41	4	18.72	19	70.68	0	18.00
12	78.09	6	19.08	26	71.14	0	18.00
19	75.23	3	18.54	June 2	73.28	0	18.00
26	75.56	3	18.54	9	75.56	2	18.36
Feb. 2	79.49	7	19.26	16	76.67	2	18.36
9	81.16	9	19.62	23	71.17	0	18.00
16	81.45	9	19.62	30	71.16	0	18.00
23	82.75	10	19.80				

¹ This table is constructed on the basis of the table presented by Mr. Lincoln on page 457 of his article. Computations for June, 1906, have been added; also actual weaving rates for the entire period.

crease they would pay the additional amount.”¹³ When this plan was rejected the manufacturers yielded, promising to restore the rates desired (*i. e.*, rates based on a weaving rate of 19.80 cents), at the same time protesting that the margin of profit warranted no such advance, and claiming that the advance was made only in the interest of the general welfare of the city.¹⁴ The new schedule became effective July 2, 1906.

The weaving rate of 19.80 cents per cut thus established remained in force only a few months. A widening margin of profit and a demand for cotton goods so large that, in view of a reported scarcity of labor, it could not be satisfied,¹⁵ soon led to renewed

¹³ *Chronicle*, June 23, 1906, p. 1406.

¹⁴ *Ibid.*, June 23, 1906, p. 1448. Following the action of the Manufacturers' Association, the Fall River Iron Works increased the wages of its operatives 10 per cent, "giving them that advantage over the help in other mills of the city" (*Chronicle*, Sept. 8, 1906, p. 531).

¹⁵ *Ibid.*, Jan. 5, 1907, p. 60. Mr. Lincoln in his article (p. 459) says that the prosperity of the industry at this time was "greater than ever before known."

demands for wage advances. This time the request was for a restoration of the rates prevailing before the reduction of 1903. After some parleying, a counter proposal by the employers of a compromise at 5 per cent increase (with the promise of 5 per cent more in February, 1907, if conditions should be favorable),¹⁶ and a threat of strike on the part of the employees, the manufacturers yielded, and a rate of 21.78 cents was announced to take effect November 26. The margin at this time was about 95 cents.¹⁷ And it was a part of the settlement then made that the wage determined upon should be effective for six months, at the end of which period there should be a readjustment with reference to the then existing margin.¹⁸

Accordingly, near the end of April, 1907, discussion of the wage problem was again opened. The margin of profit was found to have widened quite substantially, and the advantages which might have accrued to the operatives had they not insisted upon abandonment of the sliding scale appeared very great. The demand of the operatives was for a 10 per cent advance. This the employers were disposed to refuse, but finally the advance was granted with a sliding scale agreement attached.

In brief, the provisions of this agreement were as follows. Eighteen cents per cut was established as the minimum weaving rate for 28-inch prints at a base margin of 72.5 cents. At a margin of 75 cents the weaving rate should be 18.68 cents, and above the margin of 75 cents rates were graded in accord with the margin changes indicated in the following tabulation until a maximum margin of 115 cents was reached at which the maximum weaving rate should be 23.96 cents. The scale of progression was slightly steeper than that provided in the agreement of 1905.

Margins (Cents)	Weaving Rates (Cents)	Margins (Cents)	Weaving Rates (Cents)
115.....	23.96	85.....	20.69
110.....	23.42	80.....	19.66
105.....	22.87	75.....	18.68
95.....	21.78	72.5.....	18.00

Second, the agreement provided that rates of wages should change only once in six months, calculations being made on the

¹⁶ *Chronicle*, Nov. 24, 1906, p. 1302.

¹⁷ *Ibid.*, May 11, 1907, p. 1129.

¹⁸ *Ibid.*, Sept. 7, 1907, p. 564.

last Monday of May and November of each year, the rate to be effective in each six-month period being determined by the average margin of the preceding six months. And, quoting from section 2 of the agreement, "there shall be no change in prices on either the ascending or descending scale unless the margin has reached a point indicated in the . . . schedule."

The new agreement went into force with a weaving rate of 23.96 cents, the highest rate allowed under the terms of the bargain, and also the highest rate which had ever been paid in the Fall River mills. But the extremely high margins of 1907 were of short duration; and 1908, 1909, and 1910 witnessed successive downward movements. Not only was this true, but, in 1907, difficulties in the financial world found their way into the cotton industry, with the result that curtailment of production was considered and well under way before the end of the year.¹⁹ Corporations supposed to be filling large orders were unable to secure ready money for use in purchasing materials and in meeting payroll demands, as jobbers were embarrassed by very high interest rates in making payments on deliveries of goods.²⁰ Through the spring of 1908 curtailment in the form of a short working week was still general.²¹ At points throughout New England other than Fall River reductions in wages were the order of the day. But at Fall River the sliding scale agreement for a time saved the operatives from this form of hardship. When, near the end of May, calculations of margins and of wages were made, they showed that the financial distresses had been followed by a marked decline of the margin (which in April and May had been between 50 cents and 60 cents) and that, in accordance with the agreement, the weaving rate must drop from 23.96 cents per cut to 19.66 cents—a reduction of 17.94 per cent. The spirit in which this, the largest single reduction of wages experienced by Fall River workers, was accepted deserves only the highest commendation.²² The operatives as a whole were as yet unwilling to declare the experiment

¹⁹ For interesting information regarding the methods adopted by the mill men throughout New England to secure uniformity of curtailment see the *Chronicle* of Nov. 16, 1907, p. 1237; Nov. 23, 1907, p. 1301; Dec. 28, 1907, p. 1653.

²⁰ *Chronicle*, Nov. 23, 1907, p. 1301.

²¹ *Chronicle*, Mar. 14, 1908, p. 631; Mar. 28, 1908, pp. 757, 758; May 23, 1908, p. 1293; May 30, 1908, p. 1308.

²² Mr. Lincoln on pages 465, 466 of his article gives in full the statement issued at that time by Mr. James Tansey, then president of the Textile Council. See also Massachusetts Labor Bulletin, No. 60, pp. 263-266.

a failure, although the mule spinners led an attempt to have the agreement abandoned through the required process of serving three months' notice.²³ Instead of abandonment, revision was resorted to in September, when the scale of margins and wages was graduated somewhat more nicely, the intervals between the margins named in the schedule being made uniform at two and one half cents, as is shown below. Another slight change was the making of provision for a delay of two weeks in the enforcement of new rates of wages at the end of each six-month period.

Margins (Cents)	Weaving Rates (Cents)	Margins (Cents)	Weaving Rates (Cents)
115.....	23.96	92.5.....	21.50
112.5.....	23.69	90.....	21.23
110.....	23.42	87.5.....	20.96
107.5.....	23.14	85.....	20.69
105.....	22.87	82.5.....	20.18
102.5.....	22.59	80.....	19.66
100.....	22.32	77.5.....	19.17
97.5.....	22.05	75.....	18.68
95.....	21.78	72.5.....	18.00

In November, 1908, calculation of the margin showed another marked decline, according to which the rates of wages, under the automatic operation of the agreement, were to be expected to drop to the minimum of 18 cents. Instead, the manufacturers waived their rights and allowed the existing rates to continue in force. The situation can best be made clear by quotation from the letter of the Manufacturers' Association to the Textile Council under date of November 19, 1908.²⁴

Believing that indications point to a prosperous season, the Manufacturers' Association is inclined to waive for the present occasion its right under the contract to reduce wages and to suggest, if it be agreeable to the Textile Council, that the present rate of wages be maintained for the ensuing period of six months, it being thoroughly understood that the extra wage thus paid is something over and above what is required by the contract, which still remains binding on both

²³ The whole amended agreement is found on pages 16-18 of the handbook (above referred to) of the Carders' Union.

²⁴ Handbook of the Carders' Union, p. 19. See also Massachusetts Bureau of Statistics, *Annual Report*, 1909, pp. 44-47; *Textile World Record*, vol. 36, pp. 314, 315. *The Textile World Record* said with reference to the action of the manufacturers: "They do this undoubtedly because they believe that insisting on the reduction would be an injustice. This is the practical recognition of the important fact that the wages of textile mill operatives are below the American wage standard" (vol. 36, p. 315).

TABLE 2.—ACTUAL MARGINS AND WAGES UNDER THE AGREEMENT OF MAY 14, 1907.

Dates of wage changes	Average margins for the preceding six-month periods	Weaving rates for the succeeding six-month periods	
		Rates called for by the agreement	Rates actually in force
	(Cents)	(Cents)	(Cents)
May 27, 1907	115.60 ¹	23.96	23.96
Nov. 25, 1907	130.89	23.96	23.96
May 26, 1908	79.00	19.66	19.66
Nov. 26, 1908	60.82	18.00	19.66
May 28, 1909	74.01	18.00	19.66
Nov. 29, 1909	66.90	18.00	19.66
May 30, 1910	66.15	18.00	Agreement abandoned

¹ The margin of profit upon which the weaving rate for the six months following May 27, 1907, was based was the average margin for a period slightly shorter than six months, ending April 30, 1907 (*Chronicle*, May 11, 1907, p. 1129). The other sources of the materials tabulated above are as follows: Lincoln, *loc. cit.*, 463; Massachusetts Bureau of Statistics, *Annual Report*, 1909, pp. 44-47; Massachusetts Labor Bulletin No. 56, p. 4; No. 60, pp. 263-266; *Textile World Record*, vol. 36, pp. 204, 205, 314, 315; vol. 37, pp. 329, 330; vol. 38, pp. 363, 365; vol. 39, pp. 552, 553.

parties and is offered as in some way a substantial recognition of the good faith of the operatives in remaining true to their contractual obligations.

If, therefore, the members of the Textile Council approve this suggestion, and thus indicate their understanding that no precedent is hereby established and that the textile agreement still remains in full force, the arrangement outlined above will become effective.

The *Commercial and Financial Chronicle* gives an additional suggestion of what the conditions were which made this action of the manufacturers possible.²⁵

It is explained [by the manufacturers] that supplies of cotton were secured much below recent quotations; had the manufacturers been forced to buy raw materials and sell products at current quotations, the waiving of the rights would not have been possible.

As is shown in Table 2, the succeeding periods of wage calculation witnessed repetitions of the employers' action of November, 1908. In February, 1910, the operatives, keenly disappointed at the failure of wages to slide upward, voted to withdraw from the agreement. This gave rise to fresh discussion of future rates of wages, and tentative plans were taken up. The proposal of the employees was that of a sliding scale in which 19.66 cents

²⁵ *Chronicle*, Dec. 11, 1909, p. 1509.

TABLE 3.—WAGES, PRICES, AND MARGINS AT FALL RIVER, 1880-1896.¹

Changes of wages			Annual average wages, prices, and margins							
1	2	3	4	5	6	7	8	9	10	11
Years	Dates	New weaving rates in force	Index numbers of weaving rates Base (100)=21.00¢	Weaving rates	Index numbers of weaving rates Base (100)=21.00¢	Middling upland cotton per pound	28" print cloth per yard	28½" print cloth per yard	Margins	Index numbers of weaving rates Base (100)=21.00¢
		(Cents)		(Cents)		(Cents)	(Cents)	(Cents)	(Cents)	
1880		21.00				11.51	4.51	7.41	132.07	
1881			100.00	21.00	100.00	12.03	3.95	7.00	108.52	100.00
1882				21.00	100.00	11.56	3.76	6.50	99.73	91.90
1883				21.00	100.00	11.88	3.60	6.00	85.79	79.06
1884	Feb. 4	18.50	88.10	18.71	89.10	10.88	3.86	6.00	87.89	80.99
1885	Jan. 19	16.50	78.58	16.78	79.91	10.45	3.12	6.00	85.93	79.18
1886	Mar. 1	18.15	86.44	17.89	85.20	9.28	3.31	6.00	97.57	89.90
1887				18.15	86.44	10.21	3.33	6.00	92.58	85.31
1888	Feb. 13	19.00	90.48	18.90	90.00	10.03	3.81	6.50	113.09	104.20
1889				19.00	90.48	10.65	3.81	6.50	108.14	99.64
1890				19.00	90.48	11.07	3.34	6.00	85.92	79.17
1891				19.00	90.48	8.60	2.95	6.00	96.90	89.29
1892	July 11	19.60	93.34	19.39	92.34	7.71	3.39	6.25	118.10	108.83
	Dec. 5	21.00	100.00							
1893	Sept. 11	18.00	85.72	20.03	95.38	8.56	3.30	5.25	92.69	85.41
1894	Aug. 30	16.00	76.20	17.34	82.58	6.94	2.75	4.90	102.47	94.42
1895	Apr. 22	18.00	85.72	17.38	82.76	7.44	2.86	5.25	96.74	89.14
1896				18.00	85.72	7.93	2.60	4.66	74.21	68.39
1897				18.00	85.72	7.00	2.48	4.70	77.61	71.52
1898	Jan. 1	16.00	76.20	16.00	76.20	5.94	2.06	3.96	64.90	59.80
1899	Feb. 27	18.00	85.72	17.79	84.72	6.88	2.69	4.25	70.84	65.28
	Dec. 11	19.80	94.28							
1900				19.80	94.28	9.25	3.21	5.00	81.00	74.64
1901				19.80	94.28	8.75	2.84	4.62	70.38	64.86
1902	Mar. 17	21.78	103.72	21.36	101.72	9.00	3.11	5.00	80.75	74.41
1903	Nov. 23	19.80	94.28	21.55	102.63	11.18	3.25	5.00	66.46	61.24
1904	July 25	17.32	82.48	18.55	88.34	11.75	3.44	5.00	66.18	60.98
1905	Oct. 30	18.61	88.62	17.54	83.52	9.80	3.13	4.75	70.66	65.12
1906	July 2	19.80	94.28	19.39	92.34	11.50	3.63	5.12	74.44	68.60
	Nov. 26	21.78	103.72							
1907	May 27	23.96	114.11	23.08	109.92	12.10	4.62	6.00	106.48	98.12
1908	May 26	19.66	93.62	21.39	101.86	10.62	3.50	5.37	82.69	76.20
1909				19.66	93.62	12.68	3.67	5.06	64.90	59.80
1910				19.66	93.62	15.11	3.87	5.62	59.24	54.59
1911				19.66	93.62	13.01	3.54	5.24	62.32	57.42
1912	Mar. 25	21.62	102.96	21.16	100.76	11.52	3.82	5.22	80.21	73.91
1913				21.62	102.96	12.80	3.86	5.40	73.85	68.05
1914				21.62	102.96	11.13	3.48	5.19	75.18	69.27
1915				21.62	102.96	10.14	3.27	5.19	78.38	72.22
1916	Jan. 24	22.71	108.15	24.36	116.00					
	May 1	24.98	118.97							
	Dec. 4	27.48	130.86							

¹ The weaving rates actually in force have been taken from: (1) a table

per cut, the rate then being paid, should be the minimum rate, this to be paid at a margin of 67.5 cents or lower. The maximum rate proposed was 26.03 cents at a margin of 115 cents. Such

given by Mr. Lincoln on pages 461, 462 of his article; (2) a table of rates presented on page 22 of the Member's Contribution Book of the Card and Picker Room Protective Association of Fall River and Vicinity; and (3) from tables published from time to time in the New York *Commercial and Financial Chronicle* in the annual report on cotton and cotton manufacture, e.g., Sept. 7, 1907, p. 564. The annual report on cotton is published usually in the early part of September.

The weighted average weaving rate prevailing each year was found by weighting each rate prevailing at any time during the year by the number of weeks the rate was actually in force; e.g., in 1899 the weavers worked 8 weeks at a piece rate of 16 cents, 41 weeks at 18 cents, and 3 weeks at 19.80 cents. The weighted average rate for 1899 is therefore 17.79 cents.

The price data are from M. T. Copeland's *The Cotton Manufacturing Industry of the United States*, Appendix, p. 393, supplemented by figures from the *Statistical Abstract of the United States* (from which Dr. Copeland's figures evidently were taken).

The figures representing the annual average margins of profit are from Dr. Copeland's book (p. 394) for the years up to and including 1910. They are computed by applying the rules for calculating the margin to the price data. The margins for the years 1911-1915 have been computed by the present writer.

In the fourth, sixth, and eleventh columns the actual weaving rates in force, the weighted average weaving rates, and the annual average margins of profit are converted into series of index numbers, using the figures for 1881 as the base (100). This base was selected because (1) it seemed desirable, in the case of the weaving rates, to use as a base a rate that was actually paid at some time, rather than an average of any series of rates; (2) the weaving rate of 21 cents prevailed for a longer continuous time than any other rate in the early part of the period under consideration; (3) the exact date when the weaving rate of 21 cents reported for 1880 became operative is not known to the writer and therefore it has not been possible to find the weighted average rate prevailing in 1880; and (4) it seemed advisable not to go back farther than 1881 for a base, in order to avoid abnormal price and wage conditions which may have existed in the period of the paper money standard.

Chart I presents curves showing for the entire period 1881-1916 the movements of actual rates and of annual average margins. In this chart the scale at the left measures the movements of wages, while that at the right measures the movements of margins.

Chart II shows curves plotted on the figures in the sixth and eleventh columns of Table 3. The purpose of this chart is to assist in studying the correlation between wages and margins, while Chart I is intended to depict the conditions as they existed and for the exact periods in which each set of conditions continued.

In Table 3 and Chart I, 18.61 cents per cut (the average rate under the first sliding scale agreement) is used as the rate prevailing from October, 1905, to July, 1906.

CHART I.—WEAVING RATES AND MARGINS AT FALL RIVER, 1881-1916.
(Actual rates and annual average margins.)

———— Weaving rates. - - - - - Margins.

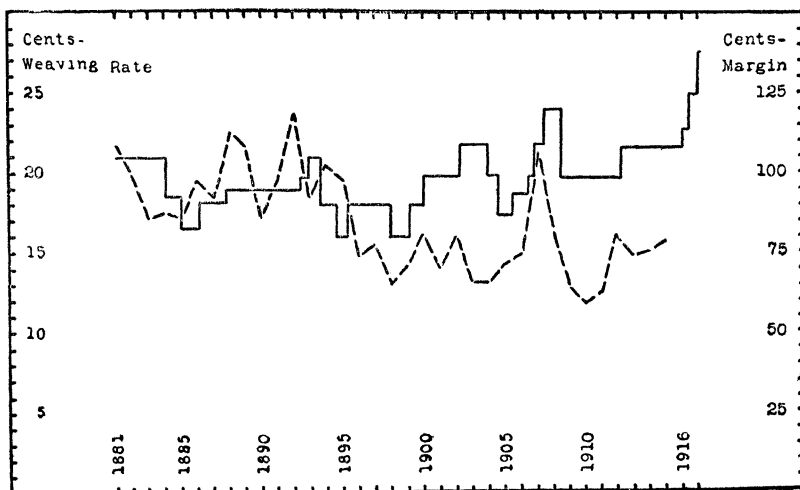
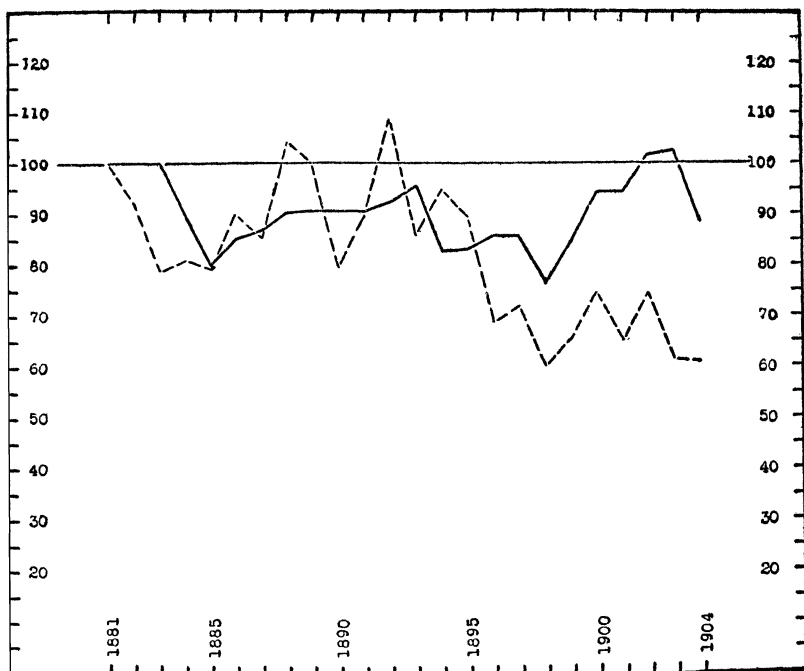


CHART II.—WEAVING RATES AND MARGINS AT FALL RIVER, 1881-1904.
(Index numbers of annual average weaving rates and margins.)

Base (100) = quotations for 1881.

———— Weaving rates. - - - - - Margins.



a scale, if adopted, would have meant an advance all along the line of between 8 per cent and 10 per cent. The manufacturers would not agree to such a marked change, being willing to make only a smaller advance on the sliding scale basis. Consequently the sliding scale experiment was abandoned.²⁶

Criticisms of the Experiment

The first general criticism of the Fall River sliding scale experiment is that it did not rest upon an adequate foundation of experience. Table 3 and Charts I and II present the facts relating to the twenty-five years preceding 1905 upon which this criticism is based. Analysis of this material shows: (1) that changes of rates of wages had no consistent relationship to changes in the margin of profit; (2) that there was more accurate adjustment of rates of wages to upward movements of the margin than to downward movements; and (3) that the most important reductions of wages were contemporaneous with business disorders not limited to the cotton manufacturing industry.

In order to secure a more definite expression of whatever relationship may have existed between changes of wages and of market conditions in this industry, Pearson's formula for the coefficient of correlation has been applied to the data of Table 3 in the manner and with the results indicated in Table 4.

TABLE 4.—THE CORRELATION OF WAGES AND PRICES AT FALL RIVER, 1881-1904.

Subject	Relative	Allowance for lag	Coefficient	Probable error
1. Weaving rate	Margin of profit	None	+.0964	±.1355
2. Weaving rate	Margin of profit	One year	+.2297	±.1295
3. Weaving rate	Cloth prices ¹	None	+.4315	±.1114
4. Weaving rate	Cloth prices ¹	One year	+.3506	±.1200
5. Weaving rate	Raw cotton prices ²	None	+.5648	±.0932
6. Weaving rate	Raw cotton prices ²	One year	+.3306	±.1218

¹ Averages of the prices of 28-inch and 38½-inch prints.

² Average annual prices of middling upland cotton.

From this it appears that the correlation between the weaving rate and the margin was smaller than that between the weaving rate and either cotton or cloth prices. This is true even when

²⁶ *Chronicle*, Sept. 10, 1910, p. 622.

allowance is made for a lag of one year in the adjustment of wages to changing commodity market conditions. Rather singularly it appears that the coefficient of correlation between weaving rates and raw cotton prices of the same year is the only coefficient of the six greater than $+0.5$ (and if from this coefficient the probable error be subtracted the coefficient falls below the $+0.5$ mark); singularly, because, if one assumes a direct causal relationship between margins and wages, one would expect that the increase of cotton prices would tend to lower wages, not to raise them.

Whatever be the explanation of the relative values of these coefficients, we must conclude that the sliding scale agreements were founded upon no basis of experience; that they cannot be regarded as providing a mechanism to secure the frictionless operation of the competitive forces through which wages in this industry had previously been adjusted.

Second, the most elaborate and nicely adjusted system of determination of rates of wages offers no guarantee against unemployment; and we have seen that the Fall River operatives, in their brief experience with the sliding scale, found that curtailment of production by means of short-time operation was still an unsolved problem.

Under unsatisfactory conditions of manufacture the employer has two means of securing relief so far as his relations with his employees are concerned; namely, the reduction of rates of wages and partial or complete stoppage of production. It is evident that the method of a horizontal reduction of wages, particularly of piece rates, presents to the manufacturer the most direct way of reducing costs per unit of product. On the other hand, the successfulness of an attempt to lower rates of wages when the margin is small and when, from the standpoint of the manufacturer, a direct lowering of the cost per unit is most to be desired may be limited, even though indefinitely, by the approach of real earnings to the minimum of the worker's standard of living. As to the conditions of trade, these may be such that the method of rate cutting defeats its own purpose. Rate cutting, by decreasing costs, tends to encourage large production. At a time of overproduction, when the mills have on hand large stocks of goods unsalable except at low prices, the obvious remedy is not further manufacture but short-time operation or dismissal of part of the operative force. For a low cost of production in the immediate future cannot remedy the hardships resulting from high cost of

goods held in storehouses and not marketable at a profit. On the other hand, the partial suspension of work has the advantage of actually curtailing output and also of being able to be effected with less open opposition on the part of employees.

Systematic and combined curtailment of output, although difficult of successful enforcement, has been sufficiently prevalent in the New England cotton manufacturing industry to have an important bearing upon the soundness of the sliding scale plan. It is of considerable importance that this curtailment has occurred with no appreciable seasonal regularity. While it is true that the months of July, August, and September (when mill stocks of raw materials are approaching exhaustion and managers are waiting for the marketing of the new crop) are the months which most frequently show employment below the average for the year, it is also true that this seasonal swing is very slight. Unemployment that occurs irregularly offers greater difficulties to be overcome in wage agreements than that which is regularly recurring.

The following figures, when compared with the content of Table 3, will help to show the importance of the present point of criticism.

UNEMPLOYMENT IN THE MASSACHUSETTS COTTON MANUFACTURING INDUSTRY.

(As measured by the per cent which the number of cotton textile operatives unemployed at some time in each year formed of the average number of employees for that year. Computed from the annual reports of the Massachusetts Bureau of Statistics on the Statistics of Manufactures.)

Years	Per cent of unemployment	Years	Per cent of unemployment
1886.....	10.7	1900.....	4.1
1887.....	7.5	1901.....	8.8
1888.....	10.7	1902.....	3.0
1889.....	2.2	1903.....	13.4
1890.....	2.2	1904.....	24.1
1891.....	1.6	1905.....	5.5
1892.....	1.9	1906.....	2.7
1893.....	23.4	1907.....	2.1
1894.....	27.4	1908.....	19.7
1895.....	3.4	1909.....	3.8
1896.....	19.1	1910.....	7.2
1897.....	12.9	1911.....	9.0
1898.....	10.9	1912.....	9.8
1899.....	3.4	1913.....	7.5

In this period of twenty-eight years there were ten years (1886, 1888, 1893, 1894, 1896, 1897, 1898, 1903, 1904, and 1908) in which the number of cotton textile employees reported to have been unemployed at some time during the year constituted at

least 10 per cent of the average number of employees for that year. Of these ten years, two (1886 and 1888) were years in which this unemployment existed while wage advances were made at Fall River. In two other of these ten years (1896 and 1897) rates of wages at Fall River were unchanged. While in the remaining six years (1893, 1894, 1898, 1903, 1904, and 1908) unemployment existed in the face of very substantial wage cuts. In other words, in these six years wage reduction was supplemented either by part-time operation or by temporary dismissal of a part of the operative force.²⁷ With the particular form of curtailment which caused this unemployment we are not here concerned except to note that at Fall River the tendency has been for the manufacturers to act collectively, to run on part time, and thus to retain the advantages of the existing factory organizations of the labor force.

In an industry in which such conditions as these prevail it cannot be ignored that a sliding scale plan may be ever so finely elaborated solely with reference to rates of wages and still offer no guarantee that the wages thus determined shall actually be paid; for the sliding scale does not assure employment. It merely provides that, if there is employment to be had, compensation shall be on a prearranged plan. If, however, the sliding scale system does sometimes tend to reduce unemployment by bringing about almost frictionless reductions of wages, then it devolves upon the laborer to weigh for himself the alternatives of steady work at low pay or more fluctuating employment at a higher rate of compensation per piece or per hour.

Third, the so-called margin of profit is not adequate to indicate the wage-paying ability of an industry, assuming that the true unit margin of profit can be ascertained and that no difficulty exists to hinder or prevent the collection and utilization of price information in computing this margin.

The philosophy of the sliding scale appears to be this: that it will eliminate from industry the friction of industrial warfare and its consequent social waste, at the same time giving reasonable assurance that the individuals and corporations concerned

²⁷ While the comparison of unemployment in mills throughout the state with wage conditions at Fall River is not as conclusive as might be desired, it is made here, first, because the information available concerning unemployment at Fall River is inadequate, and, second, because Fall River, as the foremost city in the New England cotton industry, is generally considered to typify conditions elsewhere in New England.

shall lose nothing which the operation of competitive forces would secure for them. In a sense the sliding scale is a prosperity-sharing plan. Now it is quite obvious that the prosperity of the cotton manufacturing industry is not a thing to be measured merely by the manufacturer's gross margin of profit. This method of prosperity measurement takes no account of the changing volume of trade under changing margin conditions. It is entirely conceivable that the textile mills of a New England city may secure larger sums available for dividends under conditions of narrow margins and large sales than under conditions of wide margins and small sales. The statistical demonstration that such gains have been made in any particular case is, of course, difficult, if not impossible, since it would require access to the accounts of the manufacturing corporations. Yet the impossibility of proof or disproof is beside the point, for we are not so greatly concerned with what has actually happened as with what may happen under such conditions as have been described.

To these considerations bearing upon the inadequacy of the margin as a basis for wage calculation add another—that the margin as calculated at Fall River was a crude one, which ignored entirely not only the volume of trade but also the existence of fixed charges upon the business.

As concrete evidence of the inadequacy of the margin basis of wage adjustment witness the failure of the Fall River manufacturers to insist upon rigid adherence to the terms of the agreement of 1907, when, in 1908, "believing that indications point[ed] to a prosperous season" they made slight recognition of existing low margins. That the mill owners, through their representatives, were scrupulously insistent that their considerate action should not be regarded as a precedent is beside the point. A schedule of margins and rates of wages had been made the basis of formal agreement, and within eighteen months the schedule was found to rest upon an inadequate foundation.

Fourth, it is doubtful whether it is practicable to find the real margin of profit. The sliding scale agreements are to be criticised on the ground that in the calculation of the margin of profit only two grades of cloth were considered. Although at Fall River there is a greater degree of homogeneity of the cloth products of the mills than is found in many of the New England textile centers, it is true that here at any one time thousands of employees are engaged in the production of cloths other than the 28-inch and

38½-inch prints. If the wages of these operatives are to slide in accordance with changing margins of profit, it would seem no more than reasonable to expect that the margin be calculated with reference to more than two kinds of cloth. For there can be no assurance that the prices of these two cloths are indicative of the cloth market so far as these mills are concerned.²⁸

A similar criticism might be made of the use of quotations on middling upland cotton alone. But this criticism is of minor importance, for there is reason to think that the prices of the several grades of cotton other than the middling upland bear a more constant relation to those of the latter grade than do the prices of all the different cotton fabrics to those of regular and standard prints. However this may be, we are concerned with cotton prices more with respect to the extent to which these quotations are indicative of mill costs, assuming the logically most simple possible condition, namely, that only middling cotton is used by the mills—a condition which is, of course, contrary to fact.

This is a matter which has to do with the times of margin calculation and wage adjustment under a sliding scale. The evil result of weekly calculations has already been indicated in the narrative of the events of the first experiment in 1905-1906. No doubt the six-month basis was an improvement. But there is a difficulty present no matter upon what intervals agreement is reached. There is not much object in averaging raw cotton prices for a week or even for six months with a view to determining wages unless it is known that the cotton used in production was actually bought at the prices averaged. Examination of commercial statistics shows that by far the heaviest buying of cotton stocks by northern mills is in the months of October, November, December, and January of each year. In the five years of the sliding scale experiments an average of over 57 per cent of the takings of cotton by mills in the northern part of the United States and Canada was in these four months.²⁹ The lowest percentage of these takings in these four months (45) was in the season 1907-1908, and the highest (66) in the season 1909-1910. It is evident that any system of basing wages on margins averaged

²⁸ In this connection it is interesting to note that the 28-inch 64 by 64 prints are no longer regarded as typical mill products. The best statistical tabulations of cloth prices now give quotations on 27-inch 64 by 60 prints.

²⁹ This computation is from Shepperson's *Cotton Facts*, edition of Dec., 1907, p. 26; edition of Dec., 1910, p. 26.

for six-month periods ending in May and November does not fairly allow for the uneven distribution of cotton purchases throughout the year. And yet an adjustment of the dates of margin and wage calculations to meet this seasonal fluctuation is not easy, for the fluctuation is not regular.

To make a more positive statement of this criticism—the calculation of margins, if made at all, should be made with a knowledge of the prices at which the mills concerned have actually bought supplies of cotton, and with a knowledge also of the prices actually received from time to time for the mill products. Only in this way can the real margin be ascertained. Probably this criticism is destructive rather than constructive. It is doubtful whether it would be feasible to make a sliding scale agreement which would reveal not only to employees but also to competitors the marketing policies of each corporation.³⁰ The probable result of such an attempt to eliminate labor disputes would be the bargaining of each mill with its own employees and the elimination of collective bargaining on a large scale. It is reasonable to suppose that mill owners would resort to pure profit sharing rather than accept a system which would disclose the methods by which the profits were secured.

Fifth, this experiment was based upon the ungrounded assumption that wages in any one industry can be determined by rules which relate only to the internal affairs of that industry.

The ability of cotton textile operatives to secure an advance or to resist a reduction of wages cannot be measured solely by market conditions within the cotton industry. Margins of profit have to do with the demand for labor; but they are not directly related to its supply. The latter cannot be regarded as a fixed or even steadily growing quantity. It varies on the one hand with population changes, both quantitative and qualitative. That labor supply tends to conform to labor demand is a mere truism, which means that the number of goods or services sold must be equal to the number of goods or services bought. But the demand for textile operatives is not the only demand which textile operatives can supply. Within the last two years textile workers have found a demand for their services in munitions plants,³¹ and this fact has probably exerted no inconsiderable influence in enabling

³⁰ See the statement of Mr. Edward Stanwood, secretary of the Arkwright Club of Boston, in a review of Dr. Copeland's book in the *AMERICAN ECONOMIC REVIEW*, vol. III (June, 1913), p. 372.

³¹ *Chronicle*, Aug. 29, 1916, p. 677.

these operatives to receive in 1916 advances in wages aggregating about 30 per cent. It must be evident that any formal agreement, however elaborately drawn, cannot be expected to guarantee to either workers or their employers all that could be secured by hard bargaining under competitive conditions. That is, at comparatively frequent intervals the whole sliding schedule would have to be considered anew. *Ipso facto* the scale would not slide; it would become a new scale.

This brings us to a final critical comment upon the sliding scale plan: that the detailed construction of a schedule of margins and wages, in the last analysis, is a matter of the comparative bargaining powers of employers and employees.

As we have seen, the sliding scale experiment was abandoned in 1910; first, because the employees were dissatisfied with the failure of the rates of wages to slide upward, and, second, because they were unable, in considering the extension of the agreement, to raise the whole scale of rates to a level satisfactory to themselves. In spite of the fundamental unsoundness of the whole scheme, it is not improbable that it would have been continued in operation later than the spring of 1910, if both sides had been able to agree upon a schedule.

The difficulty seems to be that there is no criterion by which the economic correctness of any proposed schedule may be judged. What would be an economically correct schedule? Presumably such would be a schedule which would accord to either party all that could be secured by the most vigorous and keen bargaining. Or, to put the question in another form, what is the criterion of the wage-paying ability of an industry? We do not know. The answer is still in process of being evolved in the cases of public and quasi-public utilities. Governor Douglas, in 1905, when arbitrating the wage dispute at Fall River, made certain allowances for dividends and for depreciation. But other authorities might make different allowances for the same items. This is a difficult problem, especially in the case of the Fall River mills, regarding whose capitalization comparatively little is publicly known.³²

The answer to the last two criticisms (that adjustments of any sliding schedule must be made periodically to meet changing industrial conditions and that there is no criterion by which the sliding schedule may be made accurately to reflect the state of competitive markets for labor) may be of this nature: that great

³² Cf. Copeland, *op. cit.*, ch. 15.

nicety of adjustment is not to be expected in such a schedule; that some gain will be effected if only the wastes of industrial conflict can be avoided; and that "in the long run" one side will gain through this inaccuracy of adjustment as much as the other. Of this last contention, however, there is no certain proof. While it might be safe to rely upon this supposed tendency to equalize advantages and disadvantages thus arising, if the sliding wage scheme were fundamentally sound, we have seen that in the Fall River case, at least, this soundness did not exist.

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